

# EDMS *Reference Manual* Supplement

## - Model Changes Between EDMS 3.03 And EDMS 3.1 -

### **Note:**

*EDMS 3.1 is released for the Windows® 95 platform only. EDMS 3.03 will remain the last release for the Windows® 3.1 platform. Windows® 3.1 users are encouraged to upgrade to Windows® 95 to enable them to take advantage of the enhancements and model changes.*

### **Aircraft**

<b><u>Change</u></b>	<b><u>Effect</u></b>
<p><u>Runway Length and Time on Runway</u></p> <p>In EDMS 3.03, the entire length of the runway was used in dispersion calculations. As a result, the length of the runway was combined with aircraft takeoff velocity to calculate a takeoff time for each aircraft. In EDMS 3.1 dispersion calculations, the length of the runway is modified at run-time for each aircraft takeoff to reflect only the actual length used by the aircraft based upon the aircraft takeoff time and velocity.</p>	<p>In most cases, concentrations downwind due to aircraft takeoffs will decrease. In some cases, such as small general aviation aircraft, this decrease may be as much as 50%. This change will result in greater resolution in characterizing aircraft takeoff and calculating dispersion. This also will ensure consistency between the aircraft takeoff time used in emission and dispersion calculations.</p>
<p><u>Aircraft Queues</u></p> <p>In EDMS 3.03, one average queue time and length per runway could be specified for all aircraft. In EDMS 3.1, the average queue time and length for each runway have been changed to a peak hour queue time and length. In addition, an option has been added to allow the user to assign hourly operational profiles to both runway peak hour queue time and length.</p>	<p>The hourly operational profiles assigned to each queue time and length are used to modify the peak hour queue time and length at run time. For example, if a peak hour queue time of 12 minutes is specified and a factor of 0.5 applies at any given hour then a corresponding queue time of 6 minutes is used for dispersion calculations. This effectively allows the user to specify a set of 24 different queue times and lengths for each runway queue based upon actual load situations for each hour of the day. This enhancement results in much greater resolution in characterizing aircraft queue and calculating dispersion.</p>
<p><u>Aircraft Categories</u></p> <p>In EDMS 3.03 aircraft were not assigned to categories. In 3.1, EDMS system aircraft are pre-assigned categories to aid in the development of several enhancements, including specifying initial aircraft dispersion coefficients (See item number 2 under Dispersion Settings). Aircraft categories are based on four criteria: weight, owner, engine type, and primary use. A list of categories for each criteria is provided in Attachment 1. A list of category assignments by aircraft type is provided in Attachment 2. The user must assign aircraft categories to user created aircraft.</p>	<p>This change will have no direct effect on emissions. However, the assignment of aircraft categories will aid in the development of several other enhancements.</p>

## **Aircraft (Continued)**

<b>Change</b>	<b>Effect</b>
<u>Aircraft System Tables</u> In EDMS 3.03, the system table for aircraft engine emission factors only contained information on engine name, mode of operation, and emission factors (in kilograms/hour) for CO, HC, NO <sub>x</sub> , SO <sub>x</sub> . In EDMS 3.1, this table has been expanded to include engine manufacturer, engine fuel flow, and data source information. EDMS system tables can be viewed and printed by the user under the "View / System Tables" option. Note: Due to the expansion of the system table, landscape mode should be used for printing.	This change has no impact on emissions or dispersion, but rather provides additional information and documentation to the user.
<u>User Created Aircraft</u> <ol style="list-style-type: none"><li>1. EDMS 3.03 stored user created aircraft in system aircraft tables. EDMS 3.1 stores user created aircraft in separate user tables in the system directory.</li><li>2. In EDMS 3.03, the user individually entered user created aircraft via the user interface. In EDMS 3.1, the user is given the option of importing user created aircraft from an ASCII file in addition to individually entering them via the user interface. See Attachment 3 for specifications on the user created aircraft import file format.</li></ol>	<ol style="list-style-type: none"><li>1. This change allows the clear delineation of static, system aircraft data and data created by the user. Additionally, this allows for easy updates of the static system data without loss of the user created data.</li><li>2. The ability to import a file of user created aircraft increases the speed and accuracy in which user created aircraft are entered.</li></ol>

## **Ground Support Equipment (GSE)**

<b>Change</b>	<b>Effect</b>
<u>Emission Factors</u> In EDMS 3.03, GSE emission factors were included for gasoline and diesel equipment, but were fixed and could not be modified by the user to account for emission control techniques for gasoline or diesel engines. In addition, emission factors were not included for alternative fuel or electric GSE. In EDMS 3.1, the capability has been added for the user to create GSE with user specified emission factors and operating times, and add them to a user table in the system database. The user created GSE subsequently may be assigned to aircraft in a study. In output reports, user created GSE included in a study are identified with a single asterisk (*), and noted as user inputs at the bottom of the report (along with user created aircraft).	This enhancement allows the user greater flexibility and accuracy in characterizing GSE emissions by accounting for such factors as emission control techniques for gasoline and diesel GSE and the use of alternative fuel and electric GSE in the fleet.

## **Vehicles**

<b>Change</b>	<b>Effect</b>
<u>Emission Factors</u> The EDMS 3.03 database of vehicular emission factors includes data up to the year 2010. The EDMS 3.1 vehicular emission factor database has been expanded to include data up to the year 2020.	This expanded database provides the user with expanded capability in projections beyond the year 2010.

## **Stationary Sources**

<b>Change</b>	<b>Effect</b>
<u>Source Diameter</u> In EDMS 3.03, the stack diameter input for stationary sources was an integer value (i.e., no decimal places) with lower and upper bounds of 1 and 10 meters, respectively. In EDMS 3.1, the stack diameter input has been revised to allow a value with any number of decimal places. The lower bound is 0.1 meters or 0.328 feet. The upper bound remains at 10 meters.	This change allows the user greater flexibility and accuracy in characterizing the stack diameter for a stationary source.

## **General Dispersion**

<b>Change</b>	<b>Effect</b>
<u>Dispersion Settings</u> 1. In EDMS 3.03, a Rural (Pasquill-Gifford) dispersion setting was chosen by default. In EDMS 3.1, the user is able to specify either Rural or Urban (Briggs) coefficients as a global dispersion setting for all sources except vehicle roadways and aircraft taxiways and queues. (Vehicle roadways and aircraft taxiways and queues are modeled using CALINE3, which is not designed to distinguish between rural and urban dispersion settings.) The selection of either Rural or Urban dispersion settings for a particular study should follow one of the procedures (preferably the land use procedure <sup>1</sup> ) suggested by Irwin <sup>2</sup> and briefly described in section 8.2.8 of EPA's <i>Guideline on Air Quality Models (Revised)</i> <sup>3</sup> .	1. This change allows the user greater flexibility and accuracy in estimating dispersion concentrations. In general, with a rural setting the dispersion curves tend to predict higher concentrations of a pollutant at receptors further away from the source and lower concentrations of the pollutant at receptors closer to the source. With an urban setting the opposite is generally true.

<sup>1</sup> See: Auer, Jr., A.H., 1978. *Correlation of Land Use and Cover with Meteorological Anomalies*. Journal of Applied Meteorology, 17(5): 636-643.

<sup>2</sup> Irwin, J.S., 1978. *Proposed Criteria for Selection of Urban Versus Rural Dispersion Coefficients*. (Draft Staff Report). Meteorology and Assessment Division, U.S. EPA, Research Triangle Park, NC. (Docket No. A-80-46, II-B-8)

<sup>3</sup> *Guideline on Air Quality Models (Revised) (Appendix W of 40 CFR Part 51)*. Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park, NC. EPA Report No. EPA-450/2-78-027R.

## General Dispersion (Continued)

Change	Effect
<u>Dispersion Settings (Continued)</u>	
<p>2. In EDMS 3.03, initial dispersion coefficients (horizontal and vertical directions) for aircraft were set to 1 meter by 1 meter by default. In EDMS 3.1, the user is able to specify initial aircraft dispersion coefficients (within an allowable range) for aircraft takeoff emissions for three aircraft size categories: heavy, large, and small. See Attachment 4 for a description of the range and basis of aircraft dispersion coefficients. See Attachment 5 for a list of EDMS system aircraft by size category.</p> <p>3. In EDMS 3.03, initial dispersion coefficients for stationary sources were set to 1 meter by 1 meter by default. In EDMS 3.1, the user is able to specify initial stationary source dispersion coefficients (horizontal and vertical directions) within a range of 0 to 10 meters for the general category of stationary sources.</p>	<p>2. This change allows the user greater flexibility and accuracy and may result in an increase or decrease in the range of 1 – 7% for receptor concentrations.</p> <p>3. This change allows the user greater flexibility and accuracy and may result in an increase or decrease in the range of 1 – 4% for receptor concentrations.</p>
<u>Airport Configuration Wind Speed Setting</u>	
<p>In EDMS 3.03, a user could manually assign aircraft to runways, queues, and taxiways or choose the option of dynamically assigning aircraft to different combinations of runways, queues, and taxiways at dispersion run-time based upon wind parameters. An airport configuration (for runways, queues, and taxiways) was selected to be in use if the prevailing wind speed was found to be equal to or <i>less</i> than the <i>maximum</i> configuration wind speed as specified by the user. Based on several user requests, the logic for the wind speed setting in airport configurations has been changed in EDMS 3.1 from <i>maximum</i> to <i>minimum</i>. The minimum configuration wind speed allowed is zero (0).</p>	<p>With the revised logic, an airport configuration is now selected to be in use if the prevailing wind speed is found to be equal to or <i>greater</i> than the <i>minimum</i> configuration wind speed as specified by the user.</p>
<u>Sulfur Oxides 3-Hour Average</u>	
<p>In EDMS 3.03, averaging results were produced for all primary National Ambient Air Quality Standards (NAAQS) non-reactive pollutants. Averaging results also were calculated for all secondary NAAQS non-reactive pollutants except one, the 3-hour standard for Sulfur Oxides (SO<sub>x</sub>). In EDMS 3.1, 3-hour averaging results for SO<sub>x</sub> are now also produced.</p>	<p>The inclusion of this computation allows EDMS to report results for all primary and secondary NAAQS non-reactive pollutants.</p>

## **General Dispersion (Continued)**

<b><u>Change</u></b>	<b><u>Effect</u></b>
<p><b><u>Screening Weather Generation</u></b></p> <p>In EDMS 3.0, the user could specify weather data for a given period of time or import a weather data file from the National Climatic Data Center (NCDC). In EDMS 3.1, the capability to generate screening weather data has been added. The user is able to specify a range of wind speeds, wind directions, temperature, stability classes, and increments to generate weather data for worst case screening dispersion runs.</p>	<p>The addition of this option allows the user to quickly and easily generate weather data and develop a worst case screening dispersion run.</p>
<p><b><u>ASCII Weather Data Import Utility</u></b></p> <p>In EDMS 3.0, the user could specify weather data for a given period of time or import a weather data file from the National Climatic Data Center (NCDC). EDMS 3.1 offers the ability to import user created weather data from an ASCII tab-delimited file. The weather file to be imported should contain four fields – temperature, wind direction, wind speed, and PG stability class that are separated by tabs. The required file format and permissible ranges of the data elements are document in Attachment 6.</p>	<p>This added capability allows users to use local weather data or to convert weather data available in different formats to the ASCII tab-delimited format for import into the model.</p>

## Attachment 1 Aircraft Categories

In 3.1, EDMS system aircraft are pre-assigned to categories based on four criteria: weight, owner, engine type, and primary use. The user must assign aircraft categories to user created aircraft. The following table identifies categories for each of the four criteria.

<u>Criteria</u>	<u>Categories</u>	<u>Category Abbreviation</u>
Weight Class	Heavy (Over 300,000 lbs)	H
	Large (40,000 to 300,000 lbs)	L
	Small (Under 40,000 lbs)	S
Owner	Civil	C
	Military	M
	General Aviation	G
Engine Type	Jet	J
	Turboprop/Turboshaft	T
	Piston	P
Primary Use	Passenger or VIP Transport	P
	Cargo or General Transport	C
	Business	B
	Helicopter	H
	Combat or Attack	A

Note: Aircraft categories were assigned based on information in the FAA *Integrated Noise Model (INM)* aircraft table and the latest revision to aircraft weight class definitions. Weight classes are based on definitions in Appendix A of FAA's *Air Traffic Control*, FAA Order 7110.65J, which was last revised on July 16, 1996. If an aircraft changed weight classes since its listing in the INM aircraft table due to the revision of FAA's *Air Traffic Control*, the new weight class was used. Aircraft category assignments were verified using two references: *The International Directory of Civil Aircraft* (Frawley, Gerard and Jim Thorn. Weston Creek: Aerospace Publications Pty Ltd., 1995) and *The International Directory of Military Aircraft* (Frawley, Gerard and Jim Thorn. Weston Creek: Aerospace Publications Pty Ltd., 1996).

**Attachment 2**  
**Aircraft Category Assignments by Aircraft Type**

<b><u>Aircraft</u></b>	<b><u>Weight Class</u></b>	<b><u>Owner</u></b>	<b><u>Engine Type</u></b>	<b><u>Primary Use</u></b>
337H Skymaster	Small	General Aviation	Piston	Business
400A Hustler	Small	General Aviation	Turboprop/Turboshaft	Business
500 Citation	Small	General Aviation	Jet	Business
550 Citation	Small	General Aviation	Jet	Business
551 Citation	Small	General Aviation	Jet	Business
552 Citation	Small	General Aviation	Jet	Business
560 Citation V	Small	General Aviation	Jet	Business
A-10A	Large	Military	Jet	Combat/Attack
A-4 SKYHAWK	Small	Military	Jet	Combat/Attack
A-4M SKYHAWK	Small	Military	Jet	Combat/Attack
A-6 INTRUDER	Large	Military	Jet	Combat/Attack
A-7 CORSAIR II	Large	Military	Jet	Combat/Attack
A-7E CORSAIR	Large	Military	Jet	Combat/Attack
A300-600	Heavy	Civil	Jet	Passenger/VIP Transport
A300-600C	Heavy	Civil	Jet	Passenger/VIP Transport
A300-600F	Heavy	Civil	Jet	Passenger/VIP Transport
A300-600R	Heavy	Civil	Jet	Passenger/VIP Transport
A300-B2-100	Heavy	Civil	Jet	Passenger/VIP Transport
A300-B2-200	Heavy	Civil	Jet	Passenger/VIP Transport
A300-B4	Heavy	Civil	Jet	Passenger/VIP Transport
A300-B4-100	Heavy	Civil	Jet	Passenger/VIP Transport
A300-B4-200	Heavy	Civil	Jet	Passenger/VIP Transport
A300-B4-605R	Heavy	Civil	Jet	Passenger/VIP Transport
A300-B4-622R	Heavy	Civil	Jet	Passenger/VIP Transport
A300-C4-200	Heavy	Civil	Jet	Passenger/VIP Transport
A300-F4-200	Heavy	Civil	Jet	Passenger/VIP Transport
A300B	Heavy	Civil	Jet	Passenger/VIP Transport
A310	Heavy	Civil	Jet	Passenger/VIP Transport
A310-200	Heavy	Civil	Jet	Passenger/VIP Transport
A310-200C	Heavy	Civil	Jet	Passenger/VIP Transport
A310-200F	Heavy	Civil	Jet	Passenger/VIP Transport
A310-300	Heavy	Civil	Jet	Passenger/VIP Transport
A310-304	Heavy	Civil	Jet	Passenger/VIP Transport
A319	Large	Civil	Jet	Passenger/VIP Transport
A320	Large	Civil	Jet	Passenger/VIP Transport
A320-100	Large	Civil	Jet	Passenger/VIP Transport
A320-200	Large	Civil	Jet	Passenger/VIP Transport
A320-211	Large	Civil	Jet	Passenger/VIP Transport
A321	Large	Civil	Jet	Passenger/VIP Transport
A321-100	Large	Civil	Jet	Passenger/VIP Transport
A330	Heavy	Civil	Jet	Passenger/VIP Transport
A330-300	Heavy	Civil	Jet	Passenger/VIP Transport
A330B	Heavy	Civil	Jet	Passenger/VIP Transport
A340-200	Heavy	Civil	Jet	Passenger/VIP Transport

A340-300	Heavy	Civil	Jet	Passenger/VIP Transport
AH-1	Small	Military	Turboprop/Turboshaft	Helicopter
Alpha 70	Small	Military	Jet	Combat/Attack
AN-72	Large	Military	Jet	Cargo/General Transport
AN-74	Large	Military	Jet	Cargo/General Transport
ATR42	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
ATR42-400	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
ATR42-500	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
ATR72-200	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
ATR72-210	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
AVRO-RJ100	Large	Civil	Jet	Passenger/VIP Transport
AVRO-RJ115	Large	Civil	Jet	Passenger/VIP Transport
AVRO-RJ70	Large	Civil	Jet	Passenger/VIP Transport
AVRO-RJ85	Large	Civil	Jet	Passenger/VIP Transport
Aztec	Small	General Aviation	Piston	Business
B. 99A	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
B52	Heavy	Military	Jet	Combat/Attack
B52-H	Heavy	Military	Jet	Combat/Attack
B707-100	Heavy	Civil	Jet	Passenger/VIP Transport
B707-120	Heavy	Civil	Jet	Passenger/VIP Transport
B707-300	Heavy	Civil	Jet	Passenger/VIP Transport
B707-300C	Heavy	Civil	Jet	Passenger/VIP Transport
B707-E	Heavy	Civil	Jet	Passenger/VIP Transport
B720-00B	Large	Civil	Jet	Passenger/VIP Transport
B727-100	Large	Civil	Jet	Passenger/VIP Transport
B727-100C	Large	Civil	Jet	Passenger/VIP Transport
B727-100F	Large	Civil	Jet	Passenger/VIP Transport
B727-100RE	Large	Civil	Jet	Passenger/VIP Transport
B727-100RF	Large	Civil	Jet	Passenger/VIP Transport
B727-200	Large	Civil	Jet	Passenger/VIP Transport
B727-200F	Large	Civil	Jet	Passenger/VIP Transport
B727-200RE	Large	Civil	Jet	Passenger/VIP Transport
B727-200RF	Large	Civil	Jet	Passenger/VIP Transport
B737-100	Large	Civil	Jet	Passenger/VIP Transport
B737-200	Large	Civil	Jet	Passenger/VIP Transport
B737-200C	Large	Civil	Jet	Passenger/VIP Transport
B737-200F	Large	Civil	Jet	Passenger/VIP Transport
B737-300	Large	Civil	Jet	Passenger/VIP Transport
B737-300F	Large	Civil	Jet	Passenger/VIP Transport
B737-400	Large	Civil	Jet	Passenger/VIP Transport
B737-500	Large	Civil	Jet	Passenger/VIP Transport
B737-600	Large	Civil	Jet	Passenger/VIP Transport
B737-700	Large	Civil	Jet	Passenger/VIP Transport
B737-800	Large	Civil	Jet	Passenger/VIP Transport
B747-100	Heavy	Civil	Jet	Passenger/VIP Transport
B747-100B	Heavy	Civil	Jet	Passenger/VIP Transport
B747-100F	Heavy	Civil	Jet	Passenger/VIP Transport
B747-100SR	Heavy	Civil	Jet	Passenger/VIP Transport



B747-200	Heavy	Civil	Jet	Passenger/VIP Transport
B747-200 (MIL)	Heavy	Military	Jet	Passenger/VIP Transport
B747-200C	Heavy	Civil	Jet	Passenger/VIP Transport
B747-200F	Heavy	Civil	Jet	Passenger/VIP Transport
B747-300	Heavy	Civil	Jet	Passenger/VIP Transport
B747-400	Heavy	Civil	Jet	Passenger/VIP Transport
B747-400F	Heavy	Civil	Jet	Passenger/VIP Transport
B747-SP	Heavy	Civil	Jet	Passenger/VIP Transport
B757-200	Large	Civil	Jet	Passenger/VIP Transport
B757-200F	Large	Civil	Jet	Passenger/VIP Transport
B767-200	Heavy	Civil	Jet	Passenger/VIP Transport
B767-200ER	Heavy	Civil	Jet	Passenger/VIP Transport
B767-300	Heavy	Civil	Jet	Passenger/VIP Transport
B767-300ER	Heavy	Civil	Jet	Passenger/VIP Transport
B767-300F	Heavy	Civil	Jet	Passenger/VIP Transport
B777-200	Heavy	Civil	Jet	Passenger/VIP Transport
B777-200 IGW	Heavy	Civil	Jet	Passenger/VIP Transport
B777-300	Heavy	Civil	Jet	Passenger/VIP Transport
BAC-111-100	Large	Civil	Jet	Passenger/VIP Transport
BAC-111-200	Large	Civil	Jet	Passenger/VIP Transport
BAC-111-300	Large	Civil	Jet	Passenger/VIP Transport
BAC-111-400	Large	Civil	Jet	Passenger/VIP Transport
BAC-111-400F	Large	Civil	Jet	Passenger/VIP Transport
BAE 125-700	Small	Military	Jet	Passenger/VIP Transport
Bae ATP	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
BAE146	Large	Civil	Jet	Passenger/VIP Transport
BAE146-100	Large	Civil	Jet	Passenger/VIP Transport
BAE146-200	Large	Civil	Jet	Passenger/VIP Transport
BAE146-300	Large	Civil	Jet	Passenger/VIP Transport
BAE146-RJ	Large	Civil	Jet	Passenger/VIP Transport
BH-1900	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
BH-1900C	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
BH-C99	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
Brawnnee	Small	General Aviation	Piston	Business
C Citation	Small	General Aviation	Jet	Business
C-101 AVIOJET	Small	Military	Jet	Combat/Attack
C-12A/B/C	Small	Military	Turboprop/Turboshaft	Passenger/VIP Transport
C-130 HERCULES	Large	Military	Turboprop/Turboshaft	Cargo/General Transport
C-130E HERCULES	Large	Military	Turboprop/Turboshaft	Cargo/General Transport
C-135	Heavy	Military	Jet	Cargo/General Transport
C-135B	Heavy	Military	Jet	Cargo/General Transport
C-141	Heavy	Military	Jet	Cargo/General Transport
C-141B	Heavy	Military	Jet	Cargo/General Transport
C-1A TRADER	Small	Military	Piston	Combat/Attack
C-21-A	Small	Military	Jet	Passenger/VIP Transport
C-9A	Large	Military	Jet	Cargo/General Transport
C-9B	Large	Military	Jet	Cargo/General Transport
Canadair Reg-100	Large	Civil	Jet	Passenger/VIP Transport

Caraja NE-821	Small	General Aviation	Turboprop/Turboshaft	Business
Caravelle-10	Large	Civil	Jet	Cargo/General Transport
Caravelle-12	Large	Civil	Jet	Cargo/General Transport
Cessna 150	Small	General Aviation	Piston	Passenger/VIP Transport
Cessna T337	Small	General Aviation	Piston	Business
Cherokee six	Small	General Aviation	Piston	Passenger/VIP Transport
CN-235-200	Small	General Aviation	Turboprop/Turboshaft	Passenger/VIP Transport
Commanche	Small	General Aviation	Piston	Passenger/VIP Transport
CONCORDE-101	Heavy	Civil	Jet	Passenger/VIP Transport
CONDORDE-102	Heavy	Civil	Jet	Passenger/VIP Transport
Convair liner	Large	Civil	Turboprop/Turboshaft	Cargo/General Transport
DASH-7	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DC10-10	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-10C	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-10F	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-15	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-30	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-30C	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-30CF Series	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-30ER	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-30F	Heavy	Civil	Jet	Passenger/VIP Transport
DC10-40	Heavy	Civil	Jet	Passenger/VIP Transport
DC8	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-50F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-51	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-51F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-52	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-52F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-53	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-53F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-54F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-55	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-55C	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-55F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-60	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-61	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-61F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-62	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-62C	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-62F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-63	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-63C	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-63F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-70	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-71	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-71F	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-72	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-72C	Heavy	Civil	Jet	Passenger/VIP Transport

DC8-73C	Heavy	Civil	Jet	Passenger/VIP Transport
DC8-73F	Heavy	Civil	Jet	Passenger/VIP Transport
DC9-10	Large	Civil	Jet	Passenger/VIP Transport
DC9-10C	Large	Civil	Jet	Passenger/VIP Transport
DC9-10F	Large	Civil	Jet	Passenger/VIP Transport
DC9-15F	Large	Civil	Jet	Passenger/VIP Transport
DC9-20	Large	Civil	Jet	Passenger/VIP Transport
DC9-30	Large	Civil	Jet	Passenger/VIP Transport
DC9-30C	Large	Civil	Jet	Passenger/VIP Transport
DC9-30F	Large	Civil	Jet	Passenger/VIP Transport
DC9-40	Large	Civil	Jet	Passenger/VIP Transport
DC9-40F	Large	Civil	Jet	Passenger/VIP Transport
DC9-50	Large	Civil	Jet	Passenger/VIP Transport
DC9-80	Large	Civil	Jet	Passenger/VIP Transport
DHC-6	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DHC-6/300	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DHC-8	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DHC-8-100	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DHC-8-200	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DHC-8-300	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DHC-8-400	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
DO 328	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
E-2 HAWKEYE	Large	Military	Turboprop/Turboshaft	Combat/Attack
EA-6B PROWLER	Large	Military	Jet	Combat/Attack
EC-135B	Large	Military	Jet	Cargo/General Transport
EC-135C	Large	Military	Jet	Cargo/General Transport
EMB-110KQ1	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
EMB-120	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
EMBRAER	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
F-14 TOMCAT	Large	Military	Jet	Combat/Attack
F-15	Large	Military	Jet	Combat/Attack
F-15 C/D	Large	Military	Jet	Combat/Attack
F-16	Small	Military	Jet	Combat/Attack
F-27 SERIES	Large	Military	Turboprop/Turboshaft	Cargo/General Transport
F-28-1000	Large	Civil	Jet	Passenger/VIP Transport
F-28-1000C	Large	Civil	Jet	Passenger/VIP Transport
F-28-2000	Large	Civil	Jet	Passenger/VIP Transport
F-28-3000	Large	Civil	Jet	Passenger/VIP Transport
F-28-3000C	Large	Civil	Jet	Passenger/VIP Transport
F-28-4000	Large	Civil	Jet	Passenger/VIP Transport
F-28-4000/600	Large	Civil	Jet	Passenger/VIP Transport
F-4 PHANTOM II	Large	Military	Jet	Combat/Attack
F-4B PHANTOM II	Large	Military	Jet	Combat/Attack
F-4N PHANTOM II	Large	Military	Jet	Combat/Attack
F-4S PHANTOM II	Large	Military	Jet	Combat/Attack
F-5F TIGER II	Small	Military	Jet	Combat/Attack
F-70-100	Large	Civil	Jet	Passenger/VIP Transport
F/A-18 HORNET	Large	Military	Jet	Combat/Attack

Falcon 100	Small	General Aviation	Jet	Business
Falcon 20	Small	General Aviation	Jet	Business
Falcon 50	Small	General Aviation	Jet	Business
FH-227	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
FOKKER 100	Large	General Aviation	Jet	Business
FOKKER 100-100	Large	General Aviation	Jet	Business
FOKKER 70	Large	General Aviation	Jet	Business
Fokker50	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
Fokker50 HI Perf	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
Fokker60 Utility	Large	Military	Turboprop/Turboshaft	Cargo/General Transport
FT337P	Small	General Aviation	Turboprop/Turboshaft	Business
Gulfstream	Small	General Aviation	Jet	Business
H-2 SEASPRITE	Small	Military	Turboprop/Turboshaft	Helicopter
H-3 SEA KING	Small	Military	Turboprop/Turboshaft	Helicopter
H-46 SEA KNIGHT	Small	Military	Turboprop/Turboshaft	Helicopter
H-46E SEA KNIGHT	Small	Military	Turboprop/Turboshaft	Helicopter
H-53 SEA STALLION	Large	Military	Turboprop/Turboshaft	Helicopter
H-550A Stallion	Small	General Aviation	Turboprop/Turboshaft	Helicopter
Harrier	Small	Military	Jet	Combat/Attack
HH-3E GREEN GIANT	Small	Military	Turboprop/Turboshaft	Helicopter
HH-3F	Small	Military	Turboprop/Turboshaft	Helicopter
HS 125	Small	Military	Jet	Passenger/VIP Transport
HS 748 2A SERIES	Large	Military	Turboprop/Turboshaft	Passenger/VIP Transport
HS 748 2B SERIES	Large	Military	Turboprop/Turboshaft	Passenger/VIP Transport
IAI 1124	Small	General Aviation	Jet	Business
IAI Westwind	Small	General Aviation	Jet	Business
IAI-101-A	Small	Military	Turboprop/Turboshaft	Cargo/General Transport
IAI-201-102	Small	Military	Turboprop/Turboshaft	Cargo/General Transport
IAI-202	Small	Military	Turboprop/Turboshaft	Cargo/General Transport
Jetstar	Small	General Aviation	Jet	Business
KC-10A	Heavy	Military	Jet	Cargo/General Transport
Kingair 200	Small	General Aviation	Turboprop/Turboshaft	Business
Kingair B200	Small	General Aviation	Turboprop/Turboshaft	Business
L-100 HERCULES	Large	Civil	Turboprop/Turboshaft	Cargo/General Transport
L-100-30	Large	Civil	Turboprop/Turboshaft	Cargo/General Transport
L-1011-1	Heavy	Civil	Turboprop/Turboshaft	Cargo/General Transport
L-1011-100	Heavy	Civil	Jet	Passenger/VIP Transport
L-1011-150	Heavy	Civil	Jet	Passenger/VIP Transport
L-1011-1F	Heavy	Civil	Jet	Passenger/VIP Transport
L-1011-200	Heavy	Civil	Jet	Passenger/VIP Transport
L-1011-250	Heavy	Civil	Jet	Passenger/VIP Transport
L-1011-50	Heavy	Civil	Jet	Passenger/VIP Transport
L-1011-500	Heavy	Civil	Jet	Passenger/VIP Transport
L-1011-500 TR	Heavy	Civil	Jet	Passenger/VIP Transport
L-188 A/C	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
Learjet 24D	Small	General Aviation	Jet	Business
Learjet 25B	Small	General Aviation	Jet	Business
Learjet 25C	Small	General Aviation	Jet	Business

Learjet 31	Small	General Aviation	Jet	Business
Learjet 35/36	Small	General Aviation	Jet	Business
MD-11	Heavy	Civil	Jet	Passenger/VIP Transport
MD-11-11	Heavy	Civil	Jet	Passenger/VIP Transport
MD-11-11C	Heavy	Civil	Jet	Passenger/VIP Transport
MD-11-11F	Heavy	Civil	Jet	Passenger/VIP Transport
MD-80	Large	Civil	Jet	Passenger/VIP Transport
MD-80-81	Large	Civil	Jet	Passenger/VIP Transport
MD-80-82	Large	Civil	Jet	Passenger/VIP Transport
MD-80-83	Large	Civil	Jet	Passenger/VIP Transport
MD-80-87	Large	Civil	Jet	Passenger/VIP Transport
MD-80-88	Large	Civil	Jet	Passenger/VIP Transport
MD-90-10	Large	Civil	Jet	Passenger/VIP Transport
MD-90-30	Large	Civil	Jet	Passenger/VIP Transport
MD-90-40	Large	Civil	Jet	Passenger/VIP Transport
Mercure-100	Large	Civil	Jet	Passenger/VIP Transport
MIG-18-50	Small	Military	Jet	Combat/Attack
MU-300	Small	General Aviation	Jet	Business
N 22B Nomad 22C	Small	Military	Turboprop/Turboshaft	Cargo/General Transport
N 24A Nomad 24A	Small	Military	Turboprop/Turboshaft	Cargo/General Transport
N262	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
Navajo	Small	General Aviation	Piston	Business
OV-10 BRONCO	Small	Military	Turboprop/Turboshaft	Combat/Attack
P-337P Skymaster	Small	General Aviation	Piston	Business
P-550 Turbo	Small	General Aviation	Turboprop/Turboshaft	Business
PA-42 Cheyenne	Small	General Aviation	Turboprop/Turboshaft	Business
PAMPA IA.63	Small	Military	Turboprop/Turboshaft	Combat/Attack
Porter PC6/B2	Small	Military	Turboprop/Turboshaft	Cargo/General Transport
REG'L JET 200	Large	Civil	Jet	Passenger/VIP Transport
REG'L JET 200 ER	Large	Civil	Jet	Passenger/VIP Transport
REG'L JET 200 LR	Large	Civil	Jet	Passenger/VIP Transport
RF-5E TIGEREYE	Small	Military	Jet	Combat/Attack
RU-231J	Large	Military	Turboprop/Turboshaft	Cargo/General Transport
S-3 VIKING	Large	Military	Jet	Combat/Attack
S550 Citation	Small	General Aviation	Jet	Business
SA-227 AC Metro3	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
SA-227 AT Exped	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
SA-227 AT Metro3	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
Saberliner 75A	Small	General Aviation	Jet	Business
SD330 Sherpa	Small	Civil	Turboprop/Turboshaft	Cargo/General Transport
SF-340-A	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
SF-340-B PLUS	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
SF600 A CANGURO	Small	General Aviation	Turboprop/Turboshaft	Business
SH-3E	Small	Military	Turboprop/Turboshaft	Helicopter
SH-3F	Small	Military	Turboprop/Turboshaft	Helicopter
SH-61AA	Small	Military	Turboprop/Turboshaft	Helicopter
SHORT 360	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
SN601 Corvette	Small	General Aviation	Jet	Business

Swearingen Merlin	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
Swearingen Metro 2	Small	Civil	Turboprop/Turboshaft	Passenger/VIP Transport
T-2	Small	Military	Jet	Combat/Attack
T-43A	Large	Military	Jet	Passenger/VIP Transport
T047A	Small	General Aviation	Jet	Business
UC-12F/M	Small	Military	Turboprop/Turboshaft	Passenger/VIP Transport
UV-18A	Small	Military	Turboprop/Turboshaft	Cargo/General Transport
VC-25A	Heavy	Military	Jet	Passenger/VIP Transport
VC-9C	Large	Military	Jet	Cargo/General Transport
Westwind 1	Small	General Aviation	Jet	Business
Westwind 2	Small	General Aviation	Jet	Business
YAK-42	Large	Civil	Jet	Passenger/VIP Transport
YS-11	Large	Civil	Turboprop/Turboshaft	Passenger/VIP Transport

### **Attachment 3**

#### **User Created Aircraft Import File Format**

The ASCII file to be imported should contain ten fields: aircraft name; number of engines; mode number (i.e., 1 to 4); time in mode (in minutes); pollutant emission factors for CO, HC, NO<sub>x</sub>, SO<sub>x</sub>, and particulates (in kilograms/hour); and the aircraft size category abbreviation. Emissions are calculated for four aircraft modes in EDMS: 1-Approach, 2-Climbout, 3-Takeoff, and 4-Taxi/Idle. Aircraft size categories and abbreviations are identified in Attachment 1. The four character size category abbreviation should be identified in the import file, listing the appropriate abbreviation for each criteria (e.g., "H" for Heavy weight class) in the order presented in Attachment 1 (i.e., weight class, owner, engine type, primary use). The fields are to be separated by tabs and a header row is not allowed. For each aircraft, four records should be specified; one for each of the four modes. Four records for an example aircraft are provided below:

B737-300	2	1	4.0	4.026528	0.103910	11.300256	0.701395	<blank>	LCJP
B737-300	2	2	2.2	3.019582	0.167755	58.043073	1.811749	<blank>	LCJP
B737-300	2	3	0.7	3.700080	0.164448	85.101840	2.220048	<blank>	LCJP
B737-300	2	4	26.0	12.665160	0.586350	1.923228	0.253303	<blank>	LCJP

## Attachment 4

### Aircraft Dispersion Coefficients

In EDMS 3.1 the user is able to specify initial aircraft dispersion coefficients, within an allowable range, for aircraft takeoff emissions for three aircraft size categories: heavy, large, and small. FAA developed a default value and range of aircraft dispersion coefficients for each of the three aircraft size categories. The default values and ranges are based on aircraft size data from *Jane's Directory of Aircraft* and advice given in Section 1.2.2, Table 1-6 of the *ISC3 User's Manual* (Volume 2) for an adjacent volume source moving in a line. The aircraft size data and ISC3 guidance were used to compute dispersion coefficients for individual aircraft types, which were then compiled by aircraft size category to obtain default values and ranges. The table below lists default values and ranges of aircraft dispersion coefficients for each of the three aircraft size categories.

Size Category	Length/Height*	Coefficients (meters)		
		Minimum	Maximum	Default
Heavy	Length	20.0	35.0	25
	Height	5.4	9.0	7
Large	Length	6.5	22.0	15
	Height	2.3	6.4	4
Small	Length	3.1	10.4	6
	Height	0.8	3.5	2

\* Length refers to Sigma Y. Height refers to Sigma Z.



**Attachment 5**  
**EDMS System Aircraft by Size Category**

<b>HEAVY AIRCRAFT</b>		
<b>Heavy Commercial Jet</b>	A300-600	DC10-10C
	A300-600C	DC10-10F
	A300-600F	DC10-15
	A300-600R	DC10-30
	A300B	DC10-30C
	A300-B2-100	DC10-30CF Series
	A300-B2-200	DC10-30ER
	A300-B4	DC10-30F
	A300-B4-100	DC10-40
	A300-B4-200	DC8
	A300-B4-605R	DC8-21
	A300-B4-622R	DC8-21F
	A300-C4-200	DC8-30 SERIES
	A300-F4-200	DC8-50F
	A310	DC8-51
	A310-200	DC8-51F
	A310-200C	DC8-52
	A310-200F	DC8-52F
	A310-300	DC8-53
	A310-304	DC8-53F
	A330	DC8-54F
	A330-300	DC8-55
	A330B	DC8-55C
	A340-200	DC8-55F
	A340-300	DC8-60
	B707-100	DC8-61
	B707-120	DC8-61F
	B707-300	DC8-62
	B707-300C	DC8-62C
	B707-300F	DC8-62F
	B707-E	DC8-63
	B747-100	DC8-63C
	B747-100B	DC8-63F
	B747-100F	DC8-70
	B747-100SR	DC8-71
	B747-200	DC8-71F
	B747-200C	DC8-72
	B747-200F	DC8-72C
	B747-300	DC8-73C
	B747-400	DC8-73F
	B747-400F	L-1011-1
	B747-SP	L-1011-100
	B767-200	L-1011-150
	B767-200ER	L-1011-1F
	B767-300	L-1011-200
	B767-300ER	L-1011-250
	B767-300F	L-1011-50

	B777-200 B777-200 IGW B777-300 CONCORDE-101 CONDORDE-102 DC10-10	L-1011-500 L-1011-500 TR MD-11 MD-11-11 MD-11-11C MD-11-11F
<b>Heavy Military Jet</b>	B52 B52-H C-135 C-135B C-141	C-141B KC-10A B747-200 (MIL) VC-25A
<b>LARGE AIRCRAFT</b>		
<b>Large Commercial Jet</b>	Caravelle-10 Caravelle-12 A319 A320 A320-100 A320-200 A320-211 A321 A321-100 AVRO-RJ100 AVRO-RJ115 AVRO-RJ70 AVRO-RJ85 B720-000 B720-00B B727-100 B727-100C B727-100F B727-100RE B727-100RF B727-200 B727-200F B727-200RE B727-200RF B737-100 B737-200 B737-200C B737-200F B737-300 B737-300F B737-400 B737-500 B737-600 B737-700 B737-800 B757-200 B757-200F BAC-111-100 BAC-111-200	BAC-111-400F BAE146 BAE146-100 BAE146-200 BAE146-300 BAE146-RJ Canadair Reg-100 DC9-10 DC9-10C DC9-10F DC9-15F DC9-20 DC9-30 DC9-30C DC9-30F DC9-40 DC9-40F DC9-50 DC9-80 F-28-1000 F-28-1000C F-28-2000 F-28-3000 F-28-3000C F-28-4000 F-28-4000/600 F-70-100 MD-80 MD-80-81 MD-80-82 MD-80-83 MD-80-87 MD-80-88 MD-90-10 MD-90-30 MD-90-40 Mercure-100 REG'L JET 200 REG'L JET 200 ER

	BAC-111-300 BAC-111-400	REG'L JET 200 LR YAK-42
<b>Large Military Jet</b>	A-10A A-6 INTRUDER A-7 CORSAIR II A-7E CORSAIR EA-6B PROWLER F/A-18 HORNET F-14 TOMCAT F-15 F-15 C/D F-4 PHANTOM II F-4B PHANTOM II	F-4N PHANTOM II F-4S PHANTOM II S-3 VIKING AN-72 AN-74 C-9A C-9B EC-135B EC-135C VC-9C T-43A
<b>Large Commercial Turboprop</b>	Convair liner L-100 HERCULES L-100-30 ATR72-200 ATR72-210 Bae ATP DASH-7	DHC-8-300 DHC-8-400 FH-227 Fokker50 Fokker50 HI Perf L-188 A/C YS-11
<b>Large Military Turboprop</b>	E-2 HAWKEYE C-130 HERCULES C-130E HERCULES F-27 SERIES Fokker60 Utility	H-53 SEA STALLION HS 748 2A SERIES HS 748 2B SERIES RU-231J
<b>Large GA Jet</b>	FOKKER 100 FOKKER 100-100	FOKKER 70
<b>SMALL AIRCRAFT</b>		
<b>Small Commercial Turboprop</b>	ATR42 ATR42-400 ATR42-500 B. 99A BH-1900 BH-1900C BH-C99 DHC-6 DHC-6/300 DHC-8 DHC-8-100 DHC-8-200 DO 328	EMB-110KQ1 EMB-120 EMBRAER N262 SA-227 AC Metro3 SA-227 AT Exped SA-227 AT Metro3 SD330 Sherpa SF-340-A SF-340-B PLUS SHORT 360 Swearingen Merlin Swearingen Metro 2
<b>Small GA Jet</b>	500 Citation 550 Citation 551 Citation 552 Citation 560 Citation V C Citation Falcon 100 Falcon 20 Falcon 50 Gulfstream	Learjet 24D Learjet 25B Learjet 25C Learjet 31 Learjet 35/36 MU-300 S550 Citation Saberliner 75A SN601 Corvette T047A

	IAI 1124 IAI Westwind Jetstar	Westwind 1 Westwind 2
<b>Small GA Piston</b>	337H Skymaster Aztec Brawnee Cessna 150 Cessna T337	Cherokee six Commanche Navajo P-337P Skymaster
<b>Small GA Turboprop</b>	400A Hustler Caraja NE-821 CN-235-200 FT337P H-550A Stallion	Kingair 200 Kingair B200 P-550 Turbo PA-42 Cheyenne SF600 A CANGURO
<b>Small Military Jet</b>	A-4 SKYHAWK A-4M SKYHAWK Alpha 70 BAE 125-700 C-101 AVIOJET C-21-A F-16	F-5F TIGER II Harrier HS 125 MIG-18-50 RF-5E TIGEREYE T-2
<b>Small Military Piston</b>	C-1A TRADER	
<b>Small Military Turboprop</b>	AH-1 C-12A/B/C H-2 SEASPRITE H-3 SEA KING H-46 SEA KNIGHT H-46E SEA KNIGHT HH-3E GREEN GIANT HH-3F IAI-101-A IAI-201-102 IAI-202	N 22B Nomad 22C N 24A Nomad 24A OV-10 BRONCO PAMPA IA.63 Porter PC6/B2 SH-3E SH-3F SH-61AA UC-12F/M UV-18A

## Attachment 6

### ASCII Weather Data Import Utility Documentation

EDMS 3.1 offers the ability to import user created weather data from an **ASCII tab-delimited** file. This added capability allows users to use local weather data or to convert weather data available in different formats to the ASCII tab-delimited format for import into the model.

The weather file to be imported should contain four fields – temperature, wind direction, wind speed, and PG stability class (in that order) separated by tabs in each row. A header row of any kind is not allowed. As the values are read into the model they are checked for accuracy and for validity within the accepted bounds as previously defined in the meteorological section of the manual. These bounds (inclusive) are:

<b>Field</b>	<b>Range</b>	<b>Default</b>
Temperature	0 to 110 degrees Fahrenheit	70 degrees Fahrenheit
Wind Direction	0 to 360 degrees in integer values	1
Wind Speed	1 to 30 m/s	1 m/s
PG Stability Class	1 to 6 in integer values	6

Imported values that fall outside these bounds are automatically noted as conversion errors and default values are assigned as listed in the table above. If the error count exceeds 20 the import utility is aborted with no records being imported.